

115TH CONGRESS  
1ST SESSION

# H. R. 1877

To establish a research, development, and technology demonstration program to improve the efficiency of gas turbines used in combined cycle and simple cycle power generation systems.

---

## IN THE HOUSE OF REPRESENTATIVES

APRIL 4, 2017

Mr. TONKO (for himself and Mr. MCKINLEY) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

---

## A BILL

To establish a research, development, and technology demonstration program to improve the efficiency of gas turbines used in combined cycle and simple cycle power generation systems.

1       *Be it enacted by the Senate and House of Representa-*  
2       *tives of the United States of America in Congress assembled,*

3       **SECTION 1. HIGH EFFICIENCY GAS TURBINES.**

4       (a) IN GENERAL.—The Secretary of Energy, through  
5       the Office of Fossil Energy, shall carry out a multiyear,  
6       multiphase program of research, development, and tech-  
7       nology demonstration to improve the efficiency of gas tur-  
8       bines used in power generation systems and to identify

1 the technologies that ultimately will lead to gas turbine  
2 combined cycle efficiency of 67 percent or simple cycle effi-  
3 ciency of 50 percent.

4 (b) PROGRAM ELEMENTS.—The program under this  
5 section shall—

6 (1) support first-of-a-kind engineering and de-  
7 tailed gas turbine design for megawatt-scale and  
8 utility-scale electric power generation, including—

9 (A) high temperature materials, including  
10 superalloys, coatings, and ceramics;

11 (B) improved heat transfer capability;

12 (C) manufacturing technology required to  
13 construct complex three-dimensional geometry  
14 parts with improved aerodynamic capability;

15 (D) combustion technology to produce  
16 higher firing temperature while lowering nitro-  
17 gen oxide and carbon monoxide emissions per  
18 unit of output;

19 (E) advanced controls and systems integra-  
20 tion;

21 (F) advanced high performance compressor  
22 technology; and

23 (G) validation facilities for the testing of  
24 components and subsystems;

1           (2) include technology demonstration through  
2           component testing, subscale testing, and full-scale  
3           testing in existing fleets;

4           (3) include field demonstrations of the devel-  
5           oped technology elements so as to demonstrate tech-  
6           nical and economic feasibility; and

7           (4) assess overall combined cycle and simple  
8           cycle system performance.

9           (c) PROGRAM GOALS.—The goals of the multiphase  
10          program established under subsection (a) shall be—

11           (1) in phase I—

12                   (A) to develop the conceptual design of ad-  
13                   vanced high efficiency gas turbines that can  
14                   achieve at least 65-percent combined cycle effi-  
15                   ciency or 47-percent simple cycle efficiency on  
16                   a lower heating value basis; and

17                   (B) to develop and demonstrate the tech-  
18                   nology required for advanced high efficiency gas  
19                   turbines that can achieve at least 65-percent  
20                   combined cycle efficiency or 47-percent simple  
21                   cycle efficiency on a lower heating value basis;  
22                   and

23           (2) in phase II, to develop the conceptual de-  
24           sign for advanced high efficiency gas turbines that  
25           can achieve at least 67-percent combined cycle effi-

1       ciency or 50-percent simple cycle efficiency on a  
2       lower heating value basis.

3       (d) PROPOSALS.—Within 180 days after the date of  
4       enactment of this Act, the Secretary shall solicit grant and  
5       contract proposals from industry, small businesses, univer-  
6       sities, and other appropriate parties for conducting activi-  
7       ties under this Act. In selecting proposals, the Secretary  
8       shall emphasize—

9               (1) the extent to which the proposal will stimu-  
10       late the creation or increased retention of jobs in the  
11       United States; and

12               (2) the extent to which the proposal will pro-  
13       mote and enhance United States technology leader-  
14       ship.

15       (e) COMPETITIVE AWARDS.—The provision of fund-  
16       ing under this section shall be on a competitive basis with  
17       an emphasis on technical merit.

18       (f) COST SHARING.—Section 988 of the Energy Pol-  
19       icy Act of 2005 (42 U.S.C. 16352) shall apply to an award  
20       of financial assistance made under this section.

21       (g) LIMITS ON PARTICIPATION.—The limits on par-  
22       ticipation applicable under section 999E of the Energy  
23       Policy Act of 2005 (42 U.S.C. 16375) shall apply to finan-  
24       cial assistance awarded under this section.

○